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ART. 23.—*Additions to the Fish Fauna of New Zealand.*

By L. T. GRIFFIN, F.Z.S., Assistant Curator, Auckland Museum.

[Read before the Auckland Institute, 19th December, 1921; received by Editor, 21st December, 1921; issued separately, 17th February, 1923.]

Plates 20-26.

SINCE the publication of my last paper* many striking examples of fish have been received at the Museum, and an account of the most interesting will be found annexed hereto. There is yet much to be done before we may consider the knowledge of our local fishes to be anything like complete. At the present time trawling operations are limited to comparatively shallow areas round our coast, consequently we know but little of the possibilities of deep-sea trawling and the productions therefrom.

I am glad to take this opportunity to acknowledge my gratitude to the following gentlemen who are actively interesting themselves in my work: To Mr. T. F. Cheeseman, F.L.S., F.Z.S., Curator of the Auckland Museum, for many courtesies in connection with my ichthyological studies; and to Mr. Allan R. McCulloch, Zoologist to the Australian Museum, Sydney, on whose long experience and expert advice I make many and frequent calls. For specimens of fish: Sandford's Limited; Mr. P. Munro; Mr. G. C. Munro; Captain Nilsson, of the s.s. "James Cosgrove"; Auckland City Council Fish-depot; Mr. J. H. Deighton, late general manager; Captain McKay and Engineer Crawford, of the s.s. "Cowan"; Mr. G. R. Hodgkinson, of the nets department; and Mr. Bostock, mate of the s.s. "Simplon."

* *Trans. N.Z. Inst.*, vol. 53, pp. 351-57, 1921.

Order HOLOCEPHALI (GHOST-SHARKS).

Family CHIMAERIDAE.

Genus CHIMAERA Linné.

Chimaera novae-zelandiae Fowler. (Plate 20, fig. 2.)

Chimaera monstrosa var. *australis* Hector, *Trans. N.Z. Inst.*, vol. 34, p. 239, pl. xiv, 1902. *C. australis* Garman, *Mem. Mus. Comp. Zool.*, vol. 40, p. 88, 1911 (not *C. australis* Shaw). *C. novae-zelandiae* Fowler, *Proc. Acad. N. Sci. Philad.*, vol. 62, p. 603, 1911.

Although this species has been described, and figured by an outline drawing, in our literature, neither description nor figure can be considered as altogether satisfactory, many important details having been omitted. The possession of fresh specimens in fine condition gives me the opportunity of redescribing and refiguring this fish.

Body elongate, compressed, the caudal axis prolonged into a long filament. Head compressed, its length 5 in that between the tip of the snout and the posterior margin of the supracaudal fin. The upper profile of the male with a prominence before the eye on which is a small clasper 10 mm. long, distal end of which is formed into a flattened knob covered with small curved spines directed backwards, and when depressed fits into a small fleshy cavity on top of the head. Eye large, $3\frac{1}{2}$ in the head. Interorbital space convex, $1\frac{1}{4}$ as wide as the eye. Gills $3\frac{1}{2}$; 9 gill-rakers on the lower half of the anterior limb. Snout conical, nostrils situated above the margin of the upper jaw. Between the upper surface of the snout and the mouth are three rows of large open pores extending round the sides of the head; the lowest, which is situated above the mouth, is the longest. Pores also occur on other parts of the head and bordering the postorbital branches of the lateral line. Mouth inferior; tritons on the dental laminae in the form of rods.

First dorsal fin with its origin a little behind the vertical of that of the pectoral; it is furnished with a strong spine, the length of which is not quite so great as the depth of the head at the centre of the eye. It is keeled on its anterior edge, striated on sides, and serrated behind. When laid back it reaches beyond the middle of the interdorsal space. First dorsal ray longest, slightly longer than the spine; those following decrease somewhat rapidly in length backward. Interdorsal space as wide as the base of the first dorsal fin, and traversed by a low membrane which is highest anteriorly. Second dorsal fin low, its margin slightly concave, the median rays being shortest while those of the anterior portion are longest; its length is rather more than half that from the tip of snout to the distal end of the supracaudal. No anal fin.

Pectoral very broad, its breadth subequal to the space between the tip of the snout and the origin of the first dorsal fin; its length is somewhat greater. When laid back it reaches the vertical of the posterior angle of the base of the ventral. Ventral originating a little behind the origin of the second dorsal; the length of its anterior margin is rather more than half that of the upper margin of the pectoral. In front of the pelvic fins are the anterior claspers, which are retractile into shallow crescentic glandular pouches. Behind the fins the large bifid claspers are situated; they are very long, three times the length of the anterior claspers and about equal to the length of the ventral fin; the inner one is split along about half its

length and both claspers are almost wholly furnished with short spines directed backwards. Supracaudal very little shorter than the subcaudal, and about equal to it in height; the caudal filament is rather longer than the distance between tip of the snout and origin of the pelvic fin.

The lateral line forms first a concave, then a convex curve above the pectoral, and thence continues along the side slightly above the middle of the height by a series of very short waves until it reaches the hinder angle of the second dorsal. It then bends downward to the lower margin of the caudal axis, and extends along the filament until it is lost. The anterior portion of the lateral line system has several conspicuous ramifications about the head. Commencing at the postorbital junction with that of the body, it passes over the eye to the first line of pores on the upper part of the snout. A lower branch from the postorbital junction passes below the eye and unites with the middle line of rostral pores, and sends off two branch lines below the posterior border of the eye; the hinder branch reaches downward over the gill-cover, and the anterior one is directed towards the angle of the mouth. There is also a short branch line across the nape, which unites with the interorbital lines on each side, and forms an angle on the median line.

Colour.—Ground-colour cream, marbled with purplish-brown. A double line of bluish-white spots above the eye from the nape to the base of the snout. Light-buff blotches and spots of various shapes occur at short intervals along the margin of the back. Lateral line dull white. First dorsal spine white, its base streaked with brown; the rays and membrane are blackish-brown with a broad mesial white band. Second dorsal with a small dark patch on its anterior rays, and thence broadly margined with black, the bases of the rays much lighter. Caudal rays uniform blackish-brown; the filament white. Pectoral and pelvic fins brownish-grey. Eye silver-white and blue-black. Horny cap on top of the head cream in colour, streaked with brown.

Described from a male specimen, 442 mm. long from tip of snout to end of supracaudal; the filament is 246 mm. long.

In all, five specimens have been examined, of which four are females. The largest is 563 mm. long without the caudal filament, the latter being 210 mm. long.

Locality.—Trawled in the Tasman Sea, nine miles to the north of Kaipara Heads, within the Auckland Provincial District, July, 1921.

Family MYRIDAE.

Genus MURAENICHTHYS Bleeker.

Muraenichthys australis Macleay. (Plate 20, fig. 1.)

Muraenichthys australis Macleay, *Proc. Linn. Soc. N.S. Wales*, vol. 6, p. 272, 1881; McCulloch, *Biol. Res. "Endeavour"* [vol. 1], pt. 1, p. 20, fig. 6, 1911.

Body cylindrical, vermiform, slender, its depth behind the gill-opening about 4 in the head and $\frac{1}{50}$ of the total length. The head rather more than 5 in the trunk and nearly $\frac{1}{12}$ in the total length. Eye small, 3 in the snout, the latter being broad, obtusely pointed, and $4\frac{3}{4}$ in the head. Cleft of mouth extends behind the eye, the distance from its angle to the posterior margin of the orbit being $1\frac{1}{2}$ times the diameter of the eye. Anterior nostrils in a tube placed near the tip of the snout, and provided

with a minute exterior lobe. A membranous flap overhanging the lips covers the posterior nostril, which is situated just before and below the eye.

Teeth cardiform, in a single row in the jaws, and a median row on the palate. A few longer ones are found on either side of the vomer covered by the lips. The anterior teeth of the mandible are a trifle longer than the posterior ones. A row of 3 pores on either side of the snout before the eye, another row of 3 on either side of the mandible. A single one on top of the head between the eyes, and another single pore on the lateral line above the gill-opening. Tongue immovable. Gill-opening small, about as wide as the eye; branchiostegal sac not greatly developed. Lateral line somewhat nearer the dorsal surface than the middle of the height; slightly arched above the branchial sac, thence bending downward towards the angle of the mouth, which it does not quite reach.

Vent placed nearer the head than the tip of tail, its distance from the snout being rather less than 1.4 in the tail.

Origin of dorsal fin a little posterior to that of the anal, and the distance from its origin to the vent about half the length of the head. Both fins are exceedingly low, almost rudimentary, but they broaden out slightly near the tip of the tail, which they surround. From the dorsal origin a groove is indicated all along the middle of the back, ending near the nape.

Colour.—Dorsal surface as far as or a trifle beyond the lateral line, pale golden-brown covered with clusters of minute darker-brown dots. Sides slightly lighter. Belly pale bluish-silver. On top of nape there is a thin transparent blood-red patch. Branchiostegal sac bright bluish-silver, with the radii slightly deeper blue. Eye bright silver and black. Tip of tail and lowest dorsal and anal rays lemon-yellow.

Described and figured from a living specimen, 247 mm. long, which was captured in Whangarei Harbour, Auckland District, by Mr. W. M. Fraser, Engineer to the Whangarei Harbour Board. Mr. Fraser informed me that he found it at a depth of 9 in. below the surface of a sandy mud-flat at low-tide mark, where the common marine grass grows.

Affinities.—The species was first described and named by Macleay from a specimen captured at Port Jackson, and later redescribed and figured by McCulloch from Macleay's original specimen. The only other one of this genus so far known to occur in New Zealand, and recorded by me in *Trans. N.Z. Inst.*, vol. 53, p. 351, pl. liv, fig. 1, 1921, is *M. breviceps*, which has several marked specific differences, particularly those in regard to the position of the dorsal fin and the form of the teeth. In *M. breviceps* the origin of the dorsal fin will be found not far behind the head, while its teeth are granular.

Locality and Distribution.—Whangarei Harbour, Auckland Provincial District; Lane Cove, Port Jackson.

Family EXOCOETIDAE.

Genus CYPSELURUS Swainson.

Cypselurus cribrus Kner. Flying-fish. (Plate 21.)

Exocoetus unicolor vel *cribrosa* Kner., *Reise "Novara," Zool.*, i, p. 325, 1867. *Cypselurus cribrus* McCulloch, *Mem. Qld. Mus.*, vol. 5, p. 59, pl. 7, 1916.

One specimen, 200 mm. long from the tip of the snout to the middle caudal rays, was received during the year, trawled in the Bay of Plenty.

A comparison of my specimen with McCulloch's description and plate shows they represent the same species, this being the first time it has been recorded from New Zealand. The two specimens examined by McCulloch are somewhat longer than the one before me, being 232 mm. and 235 mm. respectively; the difference in length is without doubt due to age only. All the fins in this species seem to be subject to considerable variation. McCulloch says the pectoral may reach either to the base of the caudal, or only to the end of the dorsal; the ventrals also vary in length. The anal may be as long as or shorter than the dorsal, and both the latter fins may have either eleven or twelve rays each.

Colour.—Deep ultramarine-blue above, the margins of the scales a little lighter. Sides bright silver from origin of pectoral to origin of ventral. Under-surface silver-white. Ventrals with light transparent membrane, their rays dusky or white. Pectorals dark without lighter cross-bands, but their margins and lowermost rays pure white. Caudal dusky with lighter margins, the lower lobe a little darker than the upper. Eye bright silver and blue-black.

I have to thank Mr. A. R. McCulloch for the privilege of using his fine plate of this species, which is taken from the publication noted at the head of this description.

Locality and Distribution.—Bay of Plenty, Auckland District, June, 1921; Port Hacking, New South Wales.

Cypselurus melanocercus Ogilby. Large Flying-fish. (Plate 22.)

Exocoetus melanocercus Ogilby, *Proc. Linn. Soc. N.S. Wales*, vol. 10, p. 123, 1885.

Br. 6; D. i/XIII; A. i/X; V. vi; P. xiv; C. xiv/ $\frac{3}{8}$.

About 62 scales between the operculum and the middle caudal rays.

Depth before the ventrals $5\frac{3}{4}$ in the length to the hypural joint, head 5 in the same. Eye $3\frac{1}{2}$ in the head and equal to the length of the snout. Interorbital space $1\frac{1}{2}$ times the diameter of the eye.

Dorsal surface from the top of the operculum to within 30 mm. of the origin of the dorsal fin straight, flat. Ventral surface evenly curved from the chin to the caudal peduncle. The latter is long, narrow; its length subequal to the distance from the tip of snout to the centre of the operculum, and its median width subequal to that of the orbit. The whole body and head, with the exception of the tip of snout, top of preorbital, lips, and chin, covered with rather large highly deciduous cycloid scales, those on the sides of the head being extremely thin, and those from the dorsal fin to the caudal getting gradually smaller than those anterior to the dorsal fin. From the operculum to the origin of the dorsal the scales are nearly all of uniform size.

Lateral line very low on the sides, somewhat indistinct anteriorly, very pronounced behind the ventrals, and reaching to the lower caudal lobe.

Upper surface of the head broad, a little convex between the eyes. The snout curves downward slightly to the premaxillary. Nostril, a large single opening near the top of the snout, and situated much nearer the eye than the tip of snout. Eye large, placed near the top of the head. Preorbital broad, rather more than half the width of the eye. Maxillary very small, and completely hidden beneath the preorbital when the mouth is closed. Mandible very short, reaching backward as far as the middle of the preorbital. Teeth in the jaws minute, in villiform bands; none on the vomer,

palatine bones, or tongue. Preoperculum with its angle rounded and somewhat oblique. Operculum rounded, its margin very thin. Gills 4, a slit behind the fourth. Gill-rakers 16, on the lower half of the anterior limb. Dorsal fin with its origin well in advance of that of the anal, and somewhat elevated. Its first ray is longest, subequal with the height of the head at the operculum; the rest decrease in length gradually backward, the last ray being about $\frac{3}{4}$ the width of the eye.

The origin of the anal is the vertical from the third-fourth dorsal rays, but its last ray is almost below the last dorsal ray. Pectoral long, reaching backward as far as the base of the procurrent caudal rays, while its greatest width is subequal with the distance from the tip of the snout to its own base.

Origin of the ventral nearly below the centre of the pectoral. Its longest ray reaches backward as far as the tips of the third-fourth anal rays, while its greatest width is subequal with the base of the pectoral. Caudal strong, its lower lobe considerably longer than the upper.

Colour.—Dark steel-blue above, somewhat lighter on the sides, with the centres of the scales a little darker as far down as the middle of the height; below this it is silver-white as far as the lateral line, which is a trifle purer white in colour. Abdomen dirty-white. Cheeks and opercles from about the centre of the eye bright silver, with very pale golden reflections. Mandibular region and lower jaw silver-white. Branchiostegal membrane white. Eye silver, with pale golden reflections and streaked bluish-grey on its outer margin, the lens being blue-black. Anterior pectoral rays light-coloured, the segmentations pale brown. The inner rays are pale brown, becoming much darker near their extremities and much lighter basally. There is a large white patch reaching across the fin almost mesially, but the position of this seems to vary somewhat in different individuals. The membrane of the pectoral varies in colour from slaty-blue at the base to almost black on its outer margin.

Dorsal fin dusky brown, the rays somewhat darker. Ventral with its central rays dusky brown, becoming lighter towards the margin; the membrane being dirty-white. Caudal brown, streaked darker.

Described from a specimen 365 mm. long from the tip of the snout to the hypural joint. Its greatest depth is 60 mm.; the length of the head 70 mm. Diameter of the eye, 18 mm.

Locality and Distribution.—Generally distributed throughout the Auckland east-coast district from the Bay of Plenty northwards. Plentiful at the entrance to the Hauraki Gulf and about the near outlying islands. Also recorded from the coast near Sydney, New South Wales, but considered rare.

Family HISTIOPTERIDAE.

Genus PARISTIOPTERUS Bleeker.

Paristiopterus labiosus. Giant Boar-fish. (Plate 23.)

Histiopertus labiosus Günther, *P.Z.S.*, p. 658, pl. 59, 1871. *H. farnelli* Waite, *Mem. Austr. Mus.*, No. 4, pt. 1, p. 116, pl. 27, 1899. *Paristiopterus labiosus* McCulloch, *Check List*, vol. 2, *Aust. Zoologist*, pt. 3, p. 92, pl. 28, fig. 239A, 1922.

D. viii/XVII; A. ii/XI; V. i/V; P. xvii; C. xvii/3+3; Br. 4.

Head 3 in the length to the hypural joint, and rather more than $1\frac{1}{2}$ in the height below the fourth dorsal spine. Eye $3\frac{1}{2}$ in the head, about as wide

as the interorbital space, and $1\frac{1}{2}$ in the snout. Gills 4, a slit behind the 4th; 15 very short gill-rakers on the lower half of the anterior limb. Pseudo-branchiae present.

Body deep, compressed, the dorsal profile forming an uneven curve, which is somewhat gibbous anteriorly in the region of the dorsal spines, and thence declivous to the caudal peduncle. The nape is sharp and rugose, and descends steeply to a prominence formed by a projection of the supraoccipital. Profile of the head concave between the eyes, convex above the snout. The ventral profile descends somewhat steeply from the chin to the origin of the ventrals, and thence straight to the anal. Caudal peduncle short, moderately broad, rounded above and below and compressed laterally; its width is equal to $1\frac{1}{4}$ that of the eye.

The whole fish, with the exception of the top of the snout and interorbital space, is covered with small rugose scales (Plate 23, A) which cannot be distinguished from one another; the fish appears as though covered with coarse-grained shagreen, which is somewhat finer on the opercular bones. Lateral line very indistinct; commencing at the top of the scapula, it ascends obliquely to its highest point below the sixth and seventh dorsal spines; it then descends gradually, and, passing across the middle of the peduncle, extends to the base of the caudal rays.

Mouth small, terminal, horizontal, the jaws equal when closed; the extremities of the jaws are crowded with minute barbels, which are longest and most crowded on the mandible. Maxillary very small, its distal portion free, and reaching backwards as far as the hinder margin of the anterior nostril. Teeth villiform, obtuse, crowded anteriorly in both jaws, and forming a narrow band towards each angle. A few slightly longer and sharper ones are found at the apices of both jaws. None on the vomer, palatines, or tongue.

Snout smooth above, with a few detached spines on its lateral margins. Each nostril with a simple oval opening, which is placed subvertically on the snout in a line with the centre of the eye, and nearer to that organ than to the tip of snout. Interorbital space smooth. Above the anterior margin of each orbit is a prominence which is densely crowded with short hard spines. Behind the eye curved extensions of the frontal bone spread upwards, and with their radii resemble outspread fans, which are separated mesially by a very narrow strip of rugose bone. Above the frontal the supraoccipital projects forward to the vertical of the centre of the orbit; its edge is sharp and covered with hard flattened asperities. Preoperculum rugose, the margin strongly denticulated; its angle is somewhat acute, and bears a cluster of spines. Operculum very finely rugose, covered with radii spreading downward and backward fanwise. Suprascapula very pronounced, reaching downward to the top of the operculum. Scapula largely exposed and covered with striae, as is the hinder margin of the coracoid.

Dorsal fin originating above the preoperculum, its spinous portion continuous with the soft, and depressible into a shallow groove. The first spine is equal to one-half the diameter of the eye, while the fifth is longest and equals the height of the body. All the spines are of irregular form, flattened and striated longitudinally. Dorsal rays slender; the membrane is worn, and leaves a considerable portion of the rays free. Anal fin short, the length of its base equal to the distance between the anterior margin of the preorbital and the posterior margin of the eye. It is similar to the dorsal in character, its two spines and first and second rays being depressible in a groove, while those beyond are placed on a

slightly raised base. The first spine is equal to the first dorsal spine, and the second equals the length from the tip of snout to the anterior margin of the eye. Ventral very long, its origin beneath that of the pectoral. The longest ray reaches backward to the tip of the second anal spine when depressed. The length of the ventral spine nearly equals that of its longest ray; it is much flattened, rugose beneath and striated above like the dorsal spines. Length of the pectoral equal to the depth from the top of the orbit to the throat. Caudal subtruncate, its upper and lower lobes equal in length.

Colour.—Body yellowish-silver, somewhat deeper on the nape and above the anal fin. A black looped band, commencing at the base of the first and second dorsal spines, extends downward to the top of the operculum, and thence forward to the top of the supraoccipital. A second black band, commencing at the base of the fifth dorsal spine, extends vertically downward to the base of the pectoral, behind which it becomes very broad, and, following a lateral course along the lower half of the fish, embraces the basal quarter of the caudal peduncle and reaches the tail. A third band, commencing at the base of the sixth and seventh dorsal spines, is divided below the dorsal rays by a broad yellowish-silver streak; it becomes united again below the hinder margin of the fin, and again divided on the caudal peduncle; the upper surface of the latter is black, like the lower, while mesially the black band continues to the tail. There is also a small curved band, somewhat lighter in colour, originating at the base of pectoral, and, passing backward over the abdomen, reaches the first anal spine.

Cheeks blackish. Top of snout black. Frontal bones brown, with their radii bluish-grey. Premaxillary and mandible pink, the barbels at their apices dusky. Maxillary pale purple-pink, and covered with minute black dots. Throat pinkish-white. Operculum pale greenish-silver, the radii much lighter. Eye yellowish-silver and blue-black. Dorsal spines and rays plumbeous, the membrane black. Anal fin similar to the dorsal. Ventral spine light yellowish-silver, the rays and membrane similar to the dorsal. Pectoral blackish above, its lower rays being dull white. Caudal black, with its radii dull-greyish.

Described and figured from a young specimen, 140 mm. long to the hypural joint, which was trawled off Tauranga. Its greatest height is 70 mm., the length of the head 46 mm., the diameter of the eye 13 mm., and the depth of the caudal peduncle 16 mm.

Locality.—Not an uncommon species, and frequently trawled in good numbers from the Hauraki Gulf as far as the Bay of Plenty.

Family SCORPIDIDAE.

Genus SCORPIS Cuvier and Valenciennes. (Plate 24.)

Definition.—Body compressed, oblong-ovate, the upper and lower profiles subequal, that above the eye convex. Body and greater part of the head covered with small ctenoid scales. Preoperculum serrated. Jaws with bands of teeth, and an outer more or less enlarged series. Minute teeth are also present on the vomer, palatines, pterygoids, and tongue. One dorsal with 9–10 spines increasing in length backwards, and 25 to 29 rays. Soft portions of the vertical fins with a scaly sheath. Pseudo-branchiae and air-bladder present. Pyloric appendages in large numbers.

KEY TO THE NEW ZEALAND SPECIES.

- A. Scales small, more than 100 above the lateral line between the head and the hypural joint. Eye moderately large. Maxillary about one-half the diameter of the eye. Interorbital space convex, but not markedly so. An equal number of rays in the dorsal and anal fins *aequipinnis*.
- AA. Scales larger, about 89 above the lateral line between the head and the hypural joint. Eye smaller than in *S. aequipinnis*. Maxillary narrower. Interorbital space markedly convex. Anal rays less numerous than those of the dorsal *violaceus*.

Scorpis aequipinnis Richardson. Sweep.

Scorpis aequipinnis Richardson, *Ichth. "Erebus" and "Terror,"* p. 121, 1848: *id.*, Günther (part), *Brit. Mus. Cat. Fish*, vol. 2, pp. 64, 518, 1860, and *Ann. Mag. Nat. Hist.* (3), xx, p. 58, 1867. *Ditrema* var. (or sp.), Sandager, in *Trans. N.Z. Inst.*, vol. 20, p. 129, 1888. *Scorpis aequipinnis* Roughley, *Fishes of Australia and their Technology*, p. 141, pl. 45, 1916; McCulloch, *Rec. Aust. Mus.*, vol. 11, p. 177, fig. 2, 1916-17.

Br. 4; D. x/XXVII; A. iii/XXVII; V. i/V; P. xviii; C. xviii/4.

More than 100 series of scales above the lateral line between the head and the hypural joint; about 18 between the base of the first dorsal ray and the lateral line, and about 34 from the lateral line to the origin of the anal fin.

Depth before the ventrals $2\frac{1}{4}$ in the length to the hypural joint; head $3\frac{1}{4}$ in the same distance. Snout 4, eye $4\frac{1}{2}$ in the head. Interorbital space $1\frac{1}{4}$ the width of the eye. Caudal peduncle rather less than 3 in the head.

Body compressed, oblong-ovate, the upper and lower profiles subequal, that above the eye moderately convex. The entire body and head, with the exception of the lips and membranous parts about the mouth and nostrils, covered with small deciduous ctenoid scales. Scaly membrane covers the dorsal and anal rays, and the spinous portion of both fins has a scaly sheath at the base increasing in height backwards. Minute scales are also found on the base of the pectoral and caudal. Origin of the lateral line at the top of the operculum; it makes an even curve to below the anterior dorsal rays, then slopes gradually and reaches the caudal. Nostrils placed a little nearer the eye than the tip of snout, each with two simple oval openings, the anterior being largest and placed almost vertically on the snout. Mandible long, narrow, reaching to below the anterior $\frac{1}{4}$ of the eye.

Premaxillary teeth in dense villiform bands with an outer series which are longer and stronger; the bands cease abruptly about midway towards the angle of the mouth, the outer series continue to it, gradually getting smaller, those within the angle itself being minute. The mandibular teeth are similar to the premaxillary teeth, but both the bands and outer series extend to the angle. Preoperculum striate and finely serrated along its lower limb and round the angle, the vertical margin being somewhat irregular with no distinct serrations. Operculum elliptically notched on its upper posterior margin.

Gills 4; gill-rakers 28, on the lower half of the anterior limb.

Origin of the dorsal fin above the anterior quarter of the pectoral. The first spine is very short, one-third the diameter of the eye; those following increase in length backwards.

Origin of the anal fin is the vertical from the eighth to ninth dorsal spines; it is similar to the dorsal in form. The first spine one-half the width of the eye, and subequal with the ninth dorsal spine. The second anal spine is equal to the width of the eye, and subequal with the third dorsal spine. The first ray is $3\frac{1}{4}$ in the head, and rather more than twice as long as the last ray.

Origin of the pectoral near to the opercular margin; its length about 3 times that of the first dorsal ray, and reaching backward as far as the vertical from the eighth dorsal spine.

Ventral inserted a little behind the base of the pectoral, its spine subequal with the second anal spine.

Caudal forked, the upper and lower lobes about equal in length.

Colour.—Dorsal to just below the lateral line dark silvery-blue, lateral line somewhat darker; below lateral line greyish-silver, lightly sprinkled with a brassy or coppery tinge; abdominal region lighter. Dorsal fin a little lighter than the back; anal similar to the dorsal but a trifle lighter. Pectoral, ventral, and caudal uniform dark bluish-grey with the rays somewhat lighter. Eye silver and blue-black.

Described and figured from a specimen, 272 mm. long from the tip of snout to the hypural joint, trawled in the Hauraki Gulf, and often miscalled "maomao," which is the Maori name for *S. violaceus*, a fish much resembling *S. aequipinnis* excepting in colour and a few other specific differences which are shown in the key at the head of this description. It is common throughout the waters of the Auckland Provincial District. When on a visit to Whangaroa in March, 1914, I found the young of this species particularly abundant, swarming beneath the rocky headlands within the harbour. I do not agree with Sandager's remarks to the effect that it does not shoal, or feed upon the surface like *S. violaceus*. I have frequently observed huge shoals moving in a wide circle round some rocky island, or backwards and forwards past a headland, always swimming leisurely, many with their backs wholly exposed, undoubtedly feeding at or near to the surface.

Locality and Distribution.—Generally distributed throughout the Auckland Provincial District; South and south-western Australia.

Family POMACENTRIDAE.

Genus CHROMIS Cuvier.

Chromis dispilus n. sp. (Plate 25.)

The following key will serve to show the principal distinguishing characters between *Chromis dispilus* and its Australian congener:—

- A. One white spot placed above the caudal peduncle immediately behind the dorsal fin. Snout obtuse, the profile markedly convex above the eye. Median dorsal spines shorter than the longest rays *hypsilepis*.
- AA. Two white spots, one below the tenth-eleventh dorsal spines, and the other below the posterior dorsal rays. Snout pointed, the profile not markedly convex above the eye. Median dorsal spines as long as the longest dorsal rays *dispilus* n. sp.

Br. 4; D. xiii/XIV; A. ii/XIV; V. i/V; P. i/XX; C. xvi/ $\frac{3}{8}$.

About 27 scales between the head and the hypural joint, the transverse series being 4 above and 10 below the lateral line.

Height of body rather less than 2 in the length to the hypural joint, the head is $3\frac{1}{2}$ in the same distance. Eye 3 in the head, and slightly wider than the interorbital space. Snout $\frac{3}{4}$ the width of the eye. Caudal peduncle 2 in the head.

Body deep, compressed, the dorsal profile more elevated than the ventral, and rising somewhat steeply from the snout to the anterior dorsal spine, thence curving evenly to the caudal peduncle. The entire body and head, with the exception of the tip of the snout, chin, lips, and maxillary bones, covered with ciliated scales, those on top of the head, cheeks, and suboperculum being much smaller than those of the operculum and body. Small scales are also found extending more than half-way up the vertical fins between the spines and rays, and similar ones furnish the sides of the tail and base of the pectoral fin. There is also a large pointed scale at the base of the ventral. Lateral line rather high, curved, and terminating below the median dorsal rays. A second but less distinct series of tubes runs along the middle of the caudal peduncle, covering about 8 or 9 scales. Mouth small, oblique, the maxillary reaching almost as far as the first quarter of the eye. Teeth conical, acute, spaced, arranged in a band in front, gradually changing into a single series on the sides, the anterior teeth in both jaws being slightly the longest. Nostril round, placed nearer to the eye than the tip of snout. Preorbital narrow, about one-third the width of the eye. Interorbital space moderately convex. Margin of the preoperculum smooth, its angle rounded. Operculum ending in a single flat spine. Gills $3\frac{1}{2}$; gill-rakers 24, on the lower half of the anterior limb. Pseudobranchiae present. Origin of the dorsal fin is the vertical from the tip of the opercular spine. Its first spine is short, three-fourths as long as the eye, the fifth and sixth the longest, rather more than half the length of the head, while those following decrease in length gradually backward, the last being equal to the second. The rays are rounded above, and somewhat elevated, the sixth and seventh subequal and longest, equal to the median dorsal spines. The origin of the anal is the vertical from the ninth dorsal spine, its length equal to the distance from the first to the ninth dorsal spines, the median rays are as long as the median dorsal rays. The first spine is short, equal to the first dorsal spine, the second strong, and equal in length to the fourth dorsal spine. Pectoral pointed, reaching backward to below the eleventh or twelfth dorsal spines, while its length is $2\frac{1}{2}$ in the total to the hypural joint. Ventral inserted a little behind the base of the pectoral, reaching backward as far as the first anal spine. Caudal forked, the upper lobe being the longest.

Colour.—Top of head and dorsal above the lateral line blackish-green, lateral line somewhat deeper. Below greenish-silver, the centres of all the scales reflecting ultramarine-blue. Behind the head and above the base of the anal fin there is a purple hue overlying the ground-colour. A white spot placed just above the lateral line below the tenth–eleventh dorsal spines, and a second white spot situated below the posterior dorsal rays. Eye golden-yellow and blue-black. Cheeks and opercles same as the body-colour below the lateral line. Opercular spine pale yellowish-white. Maxillary and lower jaw pinkish-white. Spinous dorsal dusky purple, the spines much lighter; the rays are of the same ground-colour, but there is a median band of black passing through them. Anal fine like the dorsal. Pectoral dusky pink, the rays lighter, and a large black patch at its base partly on the fin and partly on the body.

Described and figured from the holotype, a female, 157 mm. long from the tip of snout to the hypural joint, which was trawled on the west coast of the North Island of New Zealand in June, 1921. Its greatest height is 88 mm., the length of the head is 43 mm., diameter of the eye 17 mm., and the depth of the caudal peduncle 24 mm.

Variation.—Three specimens were trawled about the same time, two of which were females, with the third a male, the latter being much narrower in body than the females; apart from this they appeared identical in every other way.

Affinities.—This species is very similar to *Chromis hypsilepis*, recorded from Lord Howe Island, and the coast of Australia near Sydney, and described and figured by Mr. A. R. McCulloch in *Zool. Res. "Endeavour,"* pt. i, p. 73, pl. xiv, 1911. In submitting a specimen of our species to him for comparison with *C. hypsilepis*, he writes as follows: "I have carefully compared your specimen with several of *C. hypsilepis*, and am satisfied it represents a distinct species. Apart from the colour-marking, the differences between the two are comparative, and cannot be expressed in definite terms."

Locality.—Trawled off Reef Point, a little to the south of Ahipara Bay, North Auckland district.*

Family ZEIDAE.

Genus ZENOPSIS Gill.

Zenopsis nebulosus Schlegel. Mirror-dory. (Plate 26.)

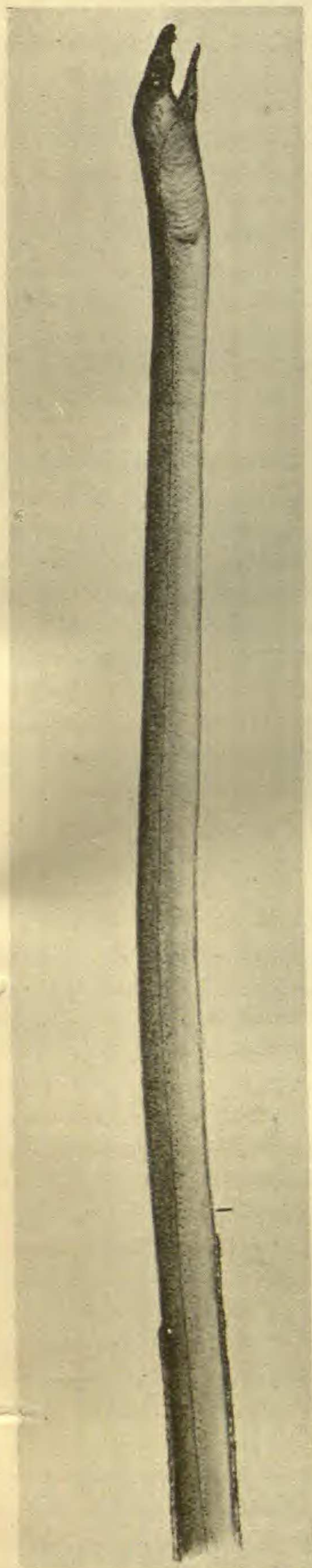
Zeus nebulosus Schlegel, *Faun. Japon., Pisces*, p. 123, pl. 66, 1847.

Zenopsis nebulosa McCulloch, *Zool. Res. "Endeavour,"* vol. 1, pt. 1, p. 83, pl. 16, fig. 1, 1911.

During the months of June and July a number of specimens of the mirror-dory were trawled by the s.s. "James Cosgrove" between White Island, in the Bay of Plenty, and the entrance to the Hauraki Gulf, Auckland, this being, I believe, the first time the species has been recognized from our waters. The most noticeable difference between this fish and the common john-dory (*Zeus faber*) lies in the remarkable mirror-like appearance of the scaleless body of the former, while it has three only instead of four anal spines. That it has not often been seen in the Auckland markets is doubtless due to the fact that it is a deep-sea species, and our trawling operations seldom extend to the deep waters it inhabits. From recent observations I feel confident it is fairly plentiful with us, and should become an important addition to our list of prized table fish.

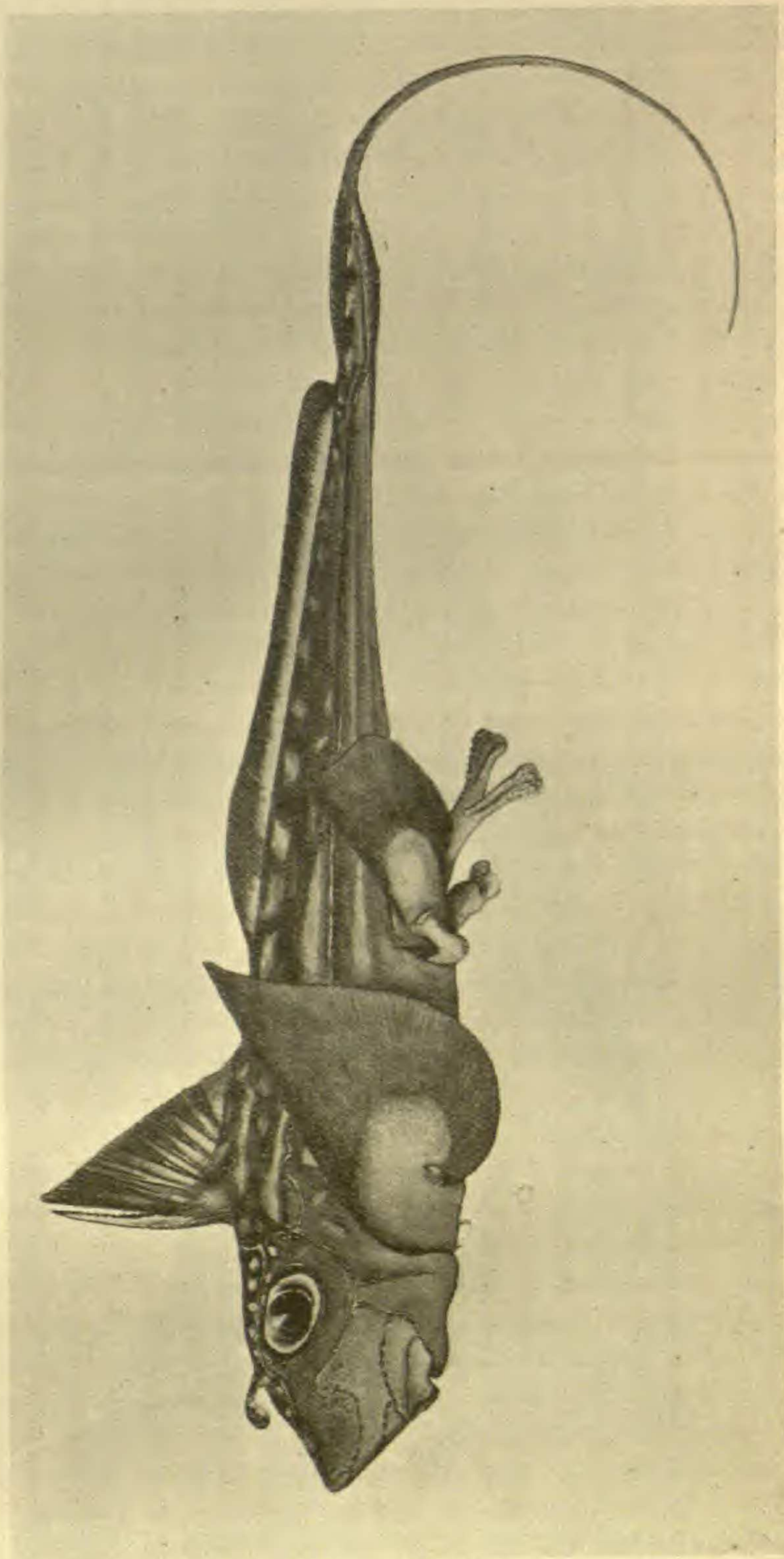
Locality.—From Hauraki Gulf to White Island, in the Bay of Plenty. McCulloch records it from off Cape Everard, Victoria, in 70 fathoms, and from twenty miles north-east of Babel Island, Bass Strait, in 68 fathoms, and Disaster Bay, New South Wales, in 45 fathoms.

* Since the above description and figure were prepared I have received five other fine specimens, caught at the Mokohinau Islands by Mr. Shirley, a local fisherman, who reports that it is not an uncommon species in that neighbourhood, but difficult to catch with hook and line.



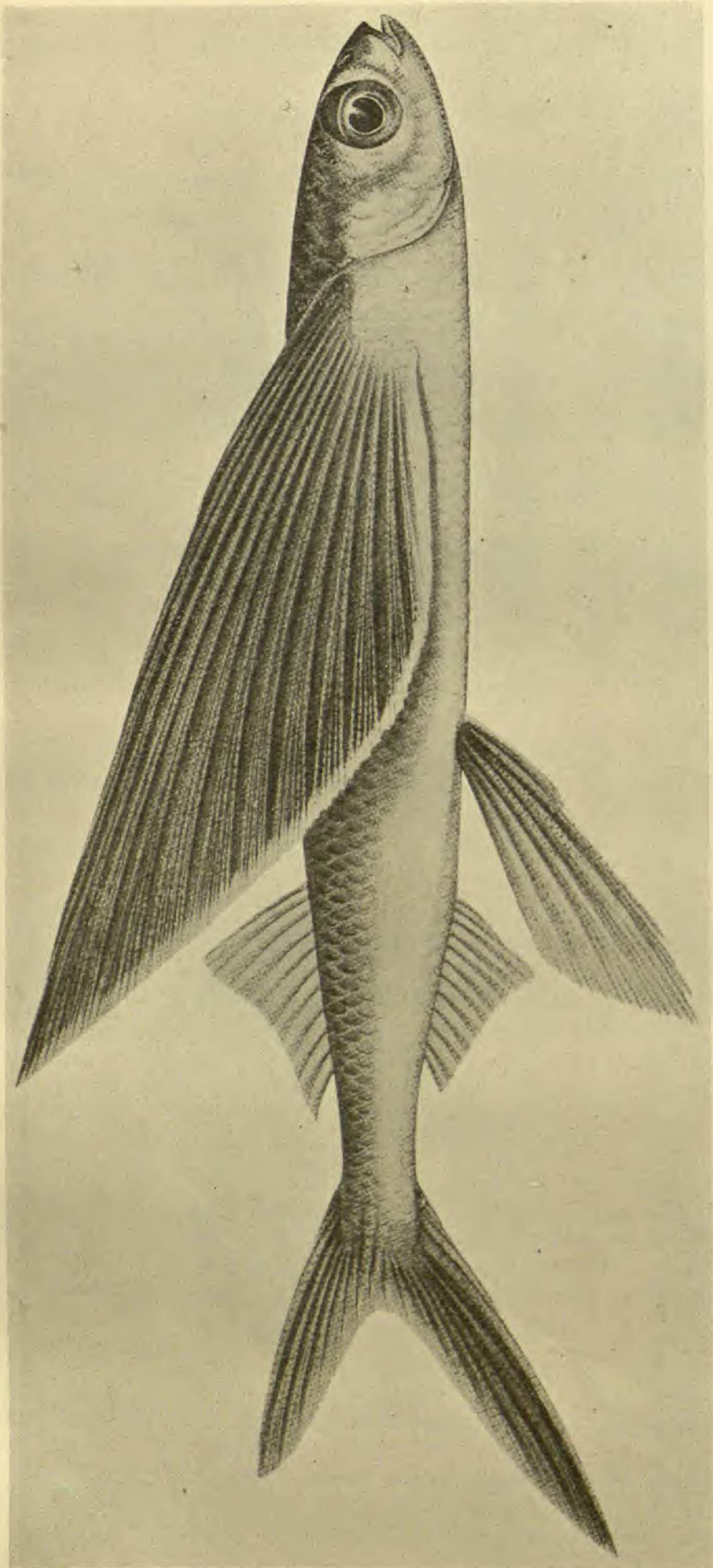
L. T. Griffin, del.

FIG. 1.—*Muraenichthys australis* Macleay. $\times \frac{4}{3}$.



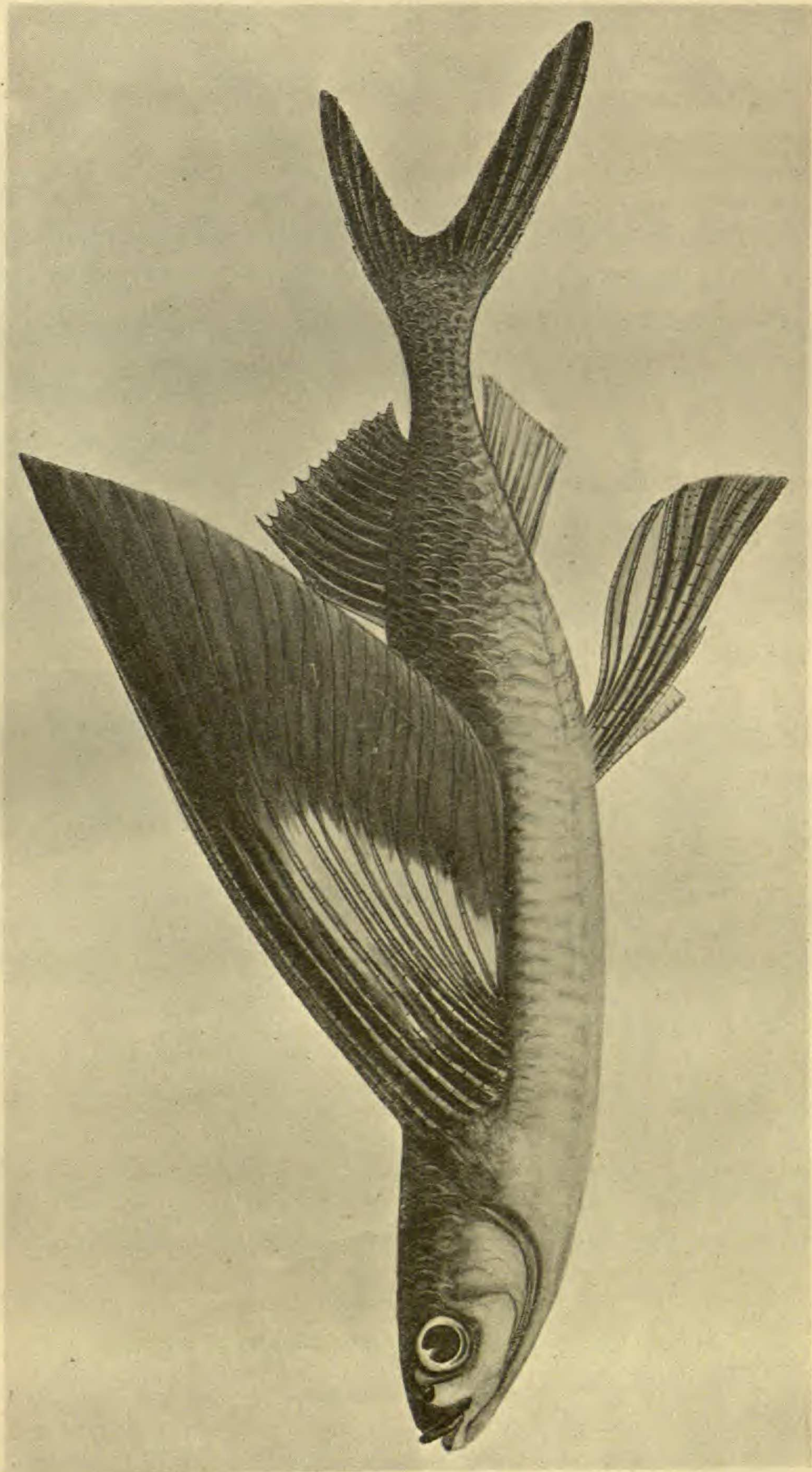
L. T. Griffin, del.

FIG. 2.—*Chimaera novae-zealandiae* Fowler. Mature male. $\times \frac{3}{2}$.



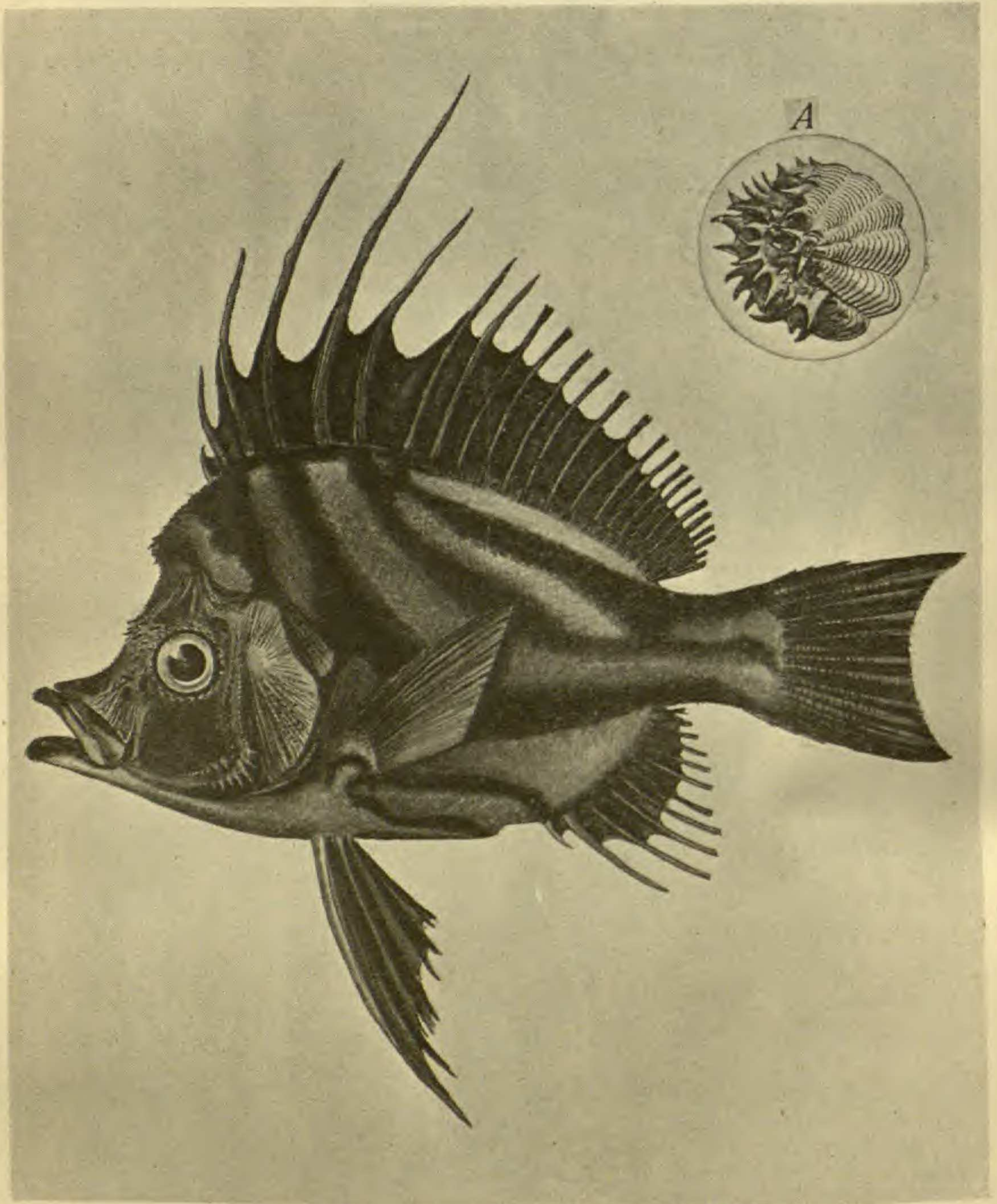
A. R. McCulloch, del.

Cypselurus cribrerosus Kner. $\times \frac{2}{3}$.



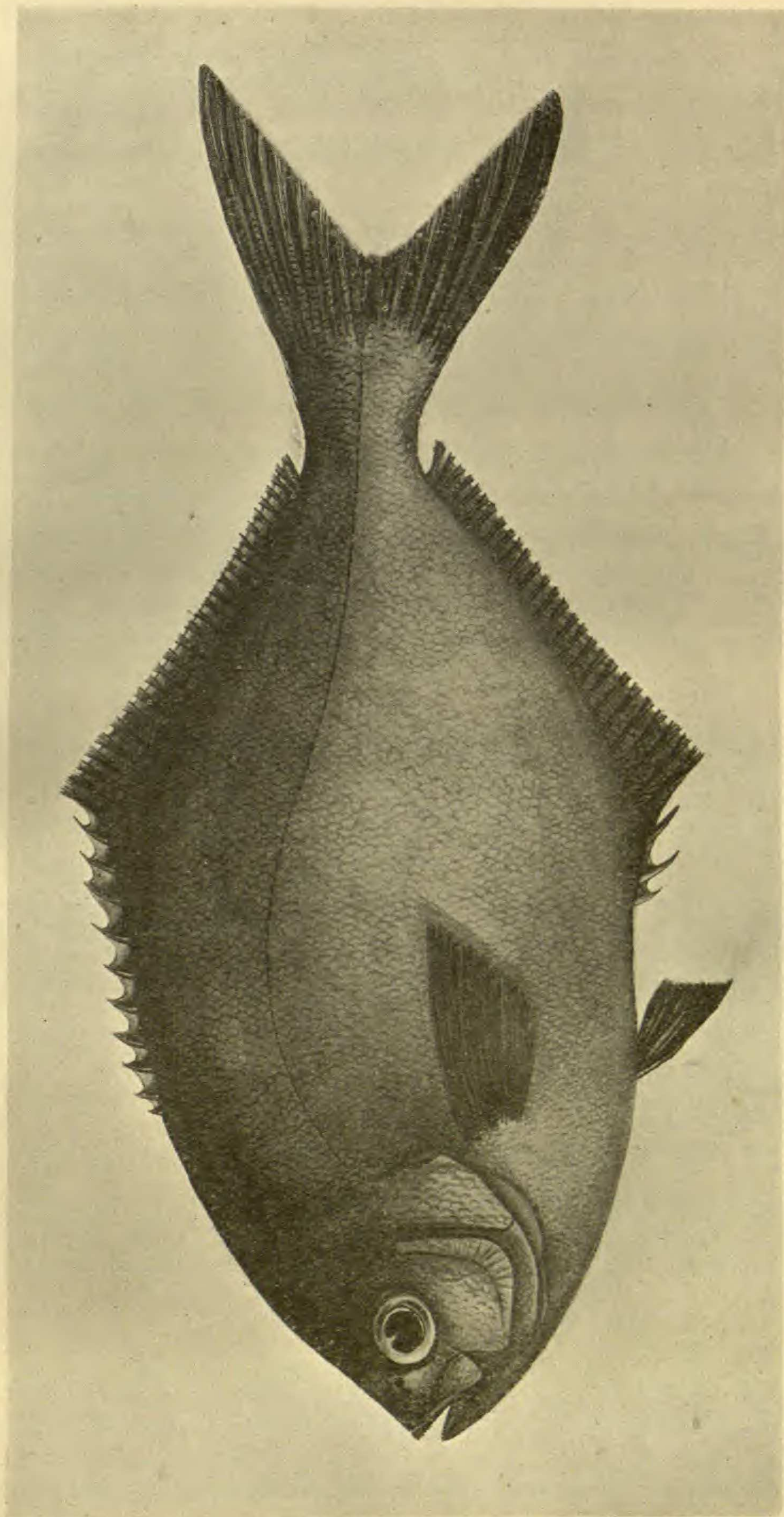
L. T. Griffin, del.

Cypselurus melanocercus Ogilby. × 3.



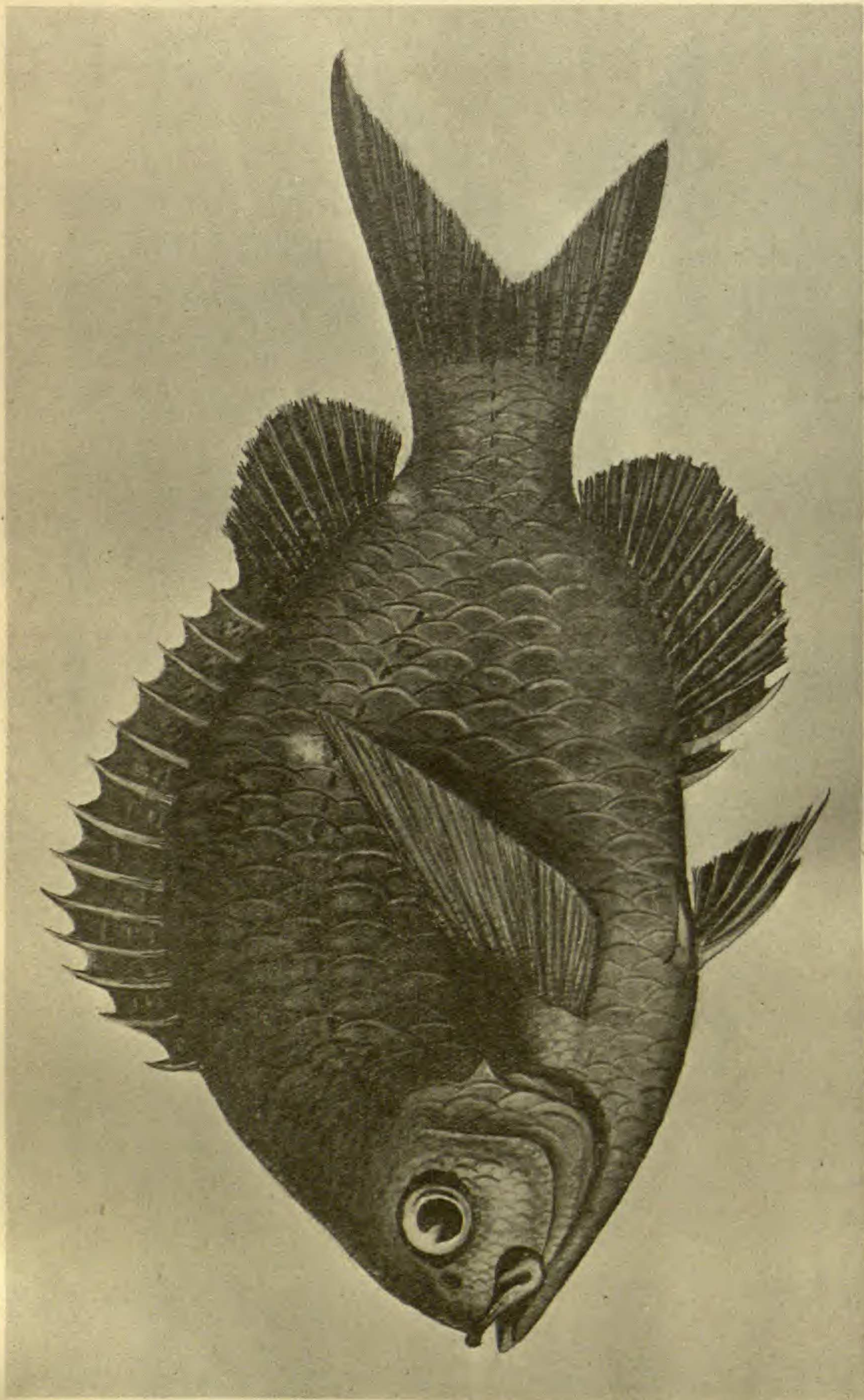
Paristiopterus labiosus. Male. $\times \frac{3}{8}$.
A, scale from the side of *Paristiopterus labiosus*. $\times 18$.

[L. T. Griffin, del.]



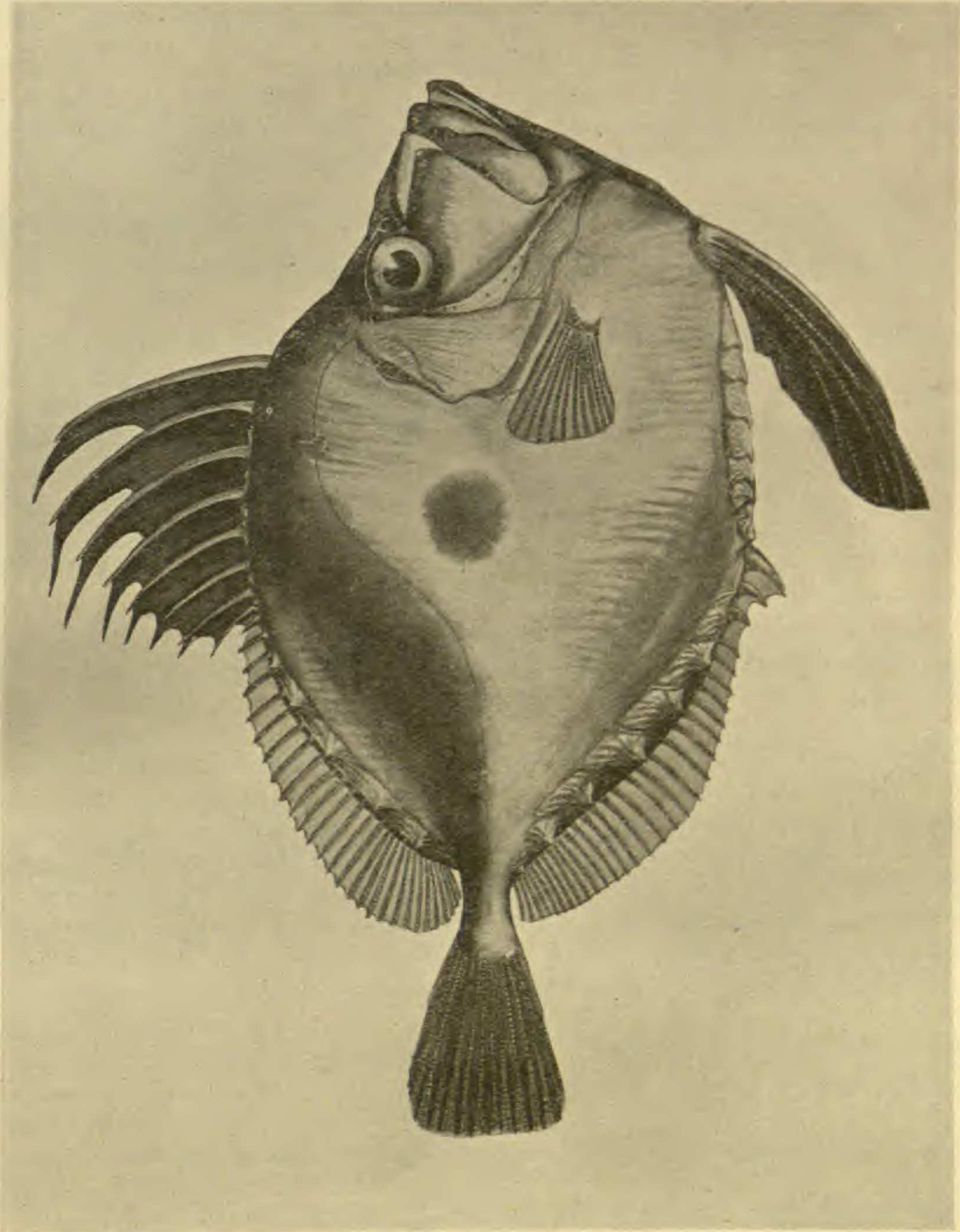
[L. T. Griffin, del.]

Scorpis aequipinnis Richardson. (Sweep.) $\times \frac{1}{2}$.



[L. T. Griffin, del.]

Chromis dispilus n. sp. $\times \frac{1}{5}$.



[L. T. Griffin, del.]

Zenopsis nebulosus Schlegel. (Mirror-dory.) $\times 1\frac{1}{4}$.